Saskatchewan Ministry of Agriculture

CROP PRODUCTION NEWS

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CROP PRODUCTION

PRODUCTION

Editor's Comments

Faye Dokken, Crops Branch, Saskatchewan Agriculture

Figure 1. Provincial Oilseed Specialist, Venkata Vakulabharanam speaking at Mustard Field Day, Swift Current on July 15, 2009.
Source: Saskatchewan Agriculture

July was a busy month! It was full of field days and learning opportunities for the agriculture industry. Rain or shine, the success of these events could be measured by the great turnouts as farmers, agrologists, researchers and students showed up in droves to check out the latest in agriculture. From old favourites, like the Scott and Melfort Field Days, to a revival of great past events, like the Mustard Field Day in Swift Current and the Crop Development Centre Field Day in Saskatoon, we were reminded of the optimism and strength of this industry in the face of challenges.

There are still a few more events scheduled – the Budding and Grafting Workshop at the U of S Horticulture Field Lab on August 7 (contact Rick Sawatzky at 978-8316), the South East Research Farm Midge and Fusarium Head Blight Wheat Resistance Field Day at Moosomin on August 19 (contact Elaine Moats at 848-2856) and the Seager Wheeler Fruit Festival near Rosthern on August 22 (contact Janice Penner at 232-5959).

NOTE: Throughout this document, you will see that some publications are in blue font and underlined, indicating links to website information. If you are reading this off your computer screen, press the CTRL button and click your cursor on the link to take you directly to the website. ☼

Crop Production News is a biweekly publication prepared primarily by provincial specialists with the Crops Branch of the Saskatchewan Ministry of Agriculture. It is a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.

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What's New in the Crop Protection Lab?

By Philip Northover, Supervisor, Crop Protection Laboratory

Figure 2: Crop Protection Laboratory Staff, Carla Weitzal (left), Philip Northover (centre) and Brianna Brown (right).
Source: Saskatchewan Agriculture

The Crop Protection Laboratory in Regina has seen some changes in 2009. On July 13, I moved from Manitoba Agriculture to began my role as supervisor of the Crop Protection Laboratory. I look forward to learning more about Saskatchewan agriculture, finding my way around the lab and identifying the various problems that will come into the lab.

Carla Weitzel continues in her role as Plant Health Technician, ensuring the numerous samples with their wide range of problems are examined and the reports go out to the clients waiting in anticipation. Brianna Brown returns for her second summer with the responsibility of culturing samples submitted for Dutch Elm Disease detection.

In the past two weeks, samples have been arriving steadily at the lab and, with the help of Clark Brenzil and Scott Hartley, chemical injury and insect specimens have been identified.

Since July 13, there have been six requests for plant identifications and two insect identifications, and 88 samples submitted for Dutch Elm Disease testing.

There have been 39 disease/chemical/environmental disorders submitted from the following crops/plants: 12 wheat, seven lentil, six barley, four pea, three canola, two alfalfa and one sample each of flax, Manitoba maple, willow, oat and soybean. Most of the specimens we received have shown indications of chemical injury and root rot.

With the onset of warmer, drier weather in the past couple of weeks, it is anticipated that symptoms of root rot from earlier in the year may become more pronounced in all crops. Root rot is often caused by one or more soil-borne pathogens, which can be identified by culturing at the lab. The pathogen responsible for the alfalfa crown rot symptoms seen in Figure 3 has not yet been identified. Typically, this type of root rot infection begins through movement of the pathogen down a wounded stem. As the infection worsens, new growth appears stunted and the plant eventually dies.☼

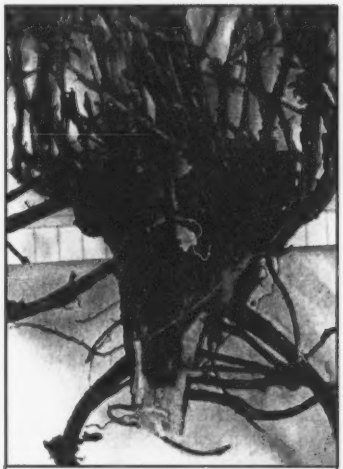

Figure 3: Crown rot in Alfalfa.
Source: Saskatchewan Agriculture

CSI: Crop Sample Information, a Key to Problem Diagnosis

By Philip Northover, Supervisor, Crop Protection Laboratory

When submitting a sample to the Crop Protection Laboratory, the actual plant is just one part of the submission. At times, the problem can be relatively easy to determine, but in many cases, observation of a sample alone is not sufficient for a diagnosis. At this point, the additional information provided to the lab staff becomes necessary for a successful diagnosis.

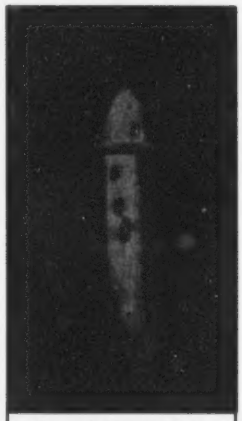

Figure 4: Sunscald on cucumber.
Source: Mary Ann Hansen, Virginia Polytechnic Institute and State University.

The sample submission form can seem rather long and an annoyance to complete, but it is a key part of the diagnostic process. Seemingly unimportant details, such as crop protection chemicals applied (even in previous growing seasons), crop rotation, weather conditions, local topography, crop variety, fertilizer application, distribution of the problem in the field, and where and when the problem was first detected, are often the minimum amount of information necessary for a diagnosis. Including too much information is never a problem.

To illustrate the need for information, below are three extreme examples of cases that crop diagnostic labs have had to solve that required more information apart from the plant alone: a cucumber with a white stripe; an ash tree with a crack going up the tree ending in a gap in the bark; and a tree losing bark with 'trails' in the wood. In the absence of any further information, only guesses can be made.

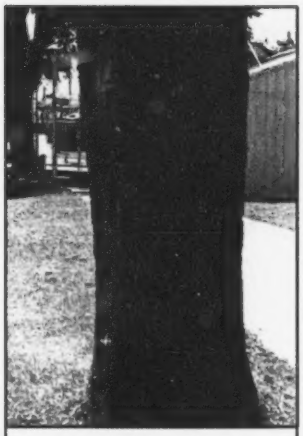

Figure 5: Damaged ash tree.
Source: Joseph O'Brien, USDA Forest Service.

In the case of the cucumber (Figure 4), additional information included: 1) the stripe only appeared on the upper surface; 2) no crop protection chemicals were applied; and 3) the leaves of many of the plants were removed. This helped a great deal to determine that 1) only exposed surfaces were affected (those against the soil did not have problems); 2) chemical damage was unlikely; and 3) removal of leaves would expose more of the plant to sunlight. Therefore, this is very likely sunscald damage due to a sudden change in sunlight exposure.

The ash tree (Figure 5) has a crack that extends from the ground to about five feet off the ground with a piece of bark missing. There are a number of possibilities.

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CSI: Crop Sample Information, a Key to Problem Diagnosis
(Continued from page 3)

To solve the puzzle, it took one key piece of information. This unfortunate tree was hit by a car, an important point left out in the initial inquiry.

The next tree (Figure 6) gave the impression that perhaps there was damage to the tree by an insect which had bored into trunk, leaving 'galleries' in the tree.

It seemed like a plausible explanation, but damage was restricted to one portion of the tree. Observations of the tree and examination of the bark alone could not pinpoint any cause. Once it was learned that, over the years, this tree was routinely used by local kids for a game in which a frisbee was thrown at the trunk, it became apparent that the damage could be attributed to this unusual problem.

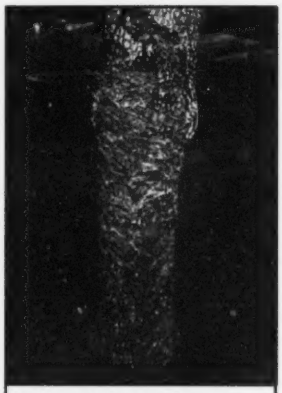

Figure 6: Frisbee damage. Source: Randy Cyr, Greentree.

While these represent extreme cases, and are by no means common to agricultural production, they illustrate that the information accompanying the sample is just as important as the plant sample itself. ✿

For information about submitting samples to Saskatchewan Agriculture's Crop Protection Lab, go to www.agriculture.gov.sk.ca/ (Programs & Services > Crop Protection Lab Services); Or phone (306) 787-8130.

Clubroot Update

By Faye Dokken, Provincial Specialist, Plant Disease

Re-testing of a soil sample from west-central Saskatchewan, using a DNA diagnostic test and a canola plant bioassay, has confirmed the presence and viability of trace levels of clubroot (*Plasmodiophora brassicae*) in one field.

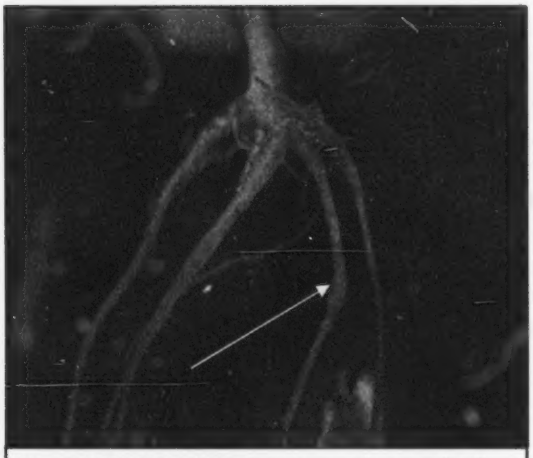

Figure 7: Swelling of canola root grown in a sample of soil from west-central Saskatchewan that contained trace levels of clubroot.
Source: Saskatchewan Agriculture.

Saskatchewan Ministry of Agriculture staff and pathologists from Agriculture and Agri-Food Canada (AAFC) conduct a survey of canola crops in the province every year to identify and quantify new and common diseases of canola. In 2008, funding was obtained from SaskCanola to collect ½-litre soil samples from 30 randomly chosen canola fields in the province during the annual canola disease survey. This funding supported analysis of samples using a DNA diagnostic test to detect the clubroot pathogen. Over the winter, analysis was repeated twice on each soil sample and three times on one sample from a field in west-central Saskatchewan, which was positive for clubroot. A bioassay was also conducted (canola plants were grown in the greenhouse in the soil sample) and no symptoms of clubroot were initially detected. Further testing was deemed necessary to reach conclusive results, and another sample was taken in April 2009 from the same field. The DNA diagnostic test was still positive and very tiny galls developed in the bioassay (Figure 7), which indicates that there is viable inoculum in that soil, but apparently the inoculum levels are very low.

More intensive surveillance of canola crops and soil testing for clubroot in the province is warranted for 2009. The annual canola disease survey will be conducted in August, as usual, and AAFC has obtained funding to sample soil from an additional 60 fields to test for clubroot. AAFC-Saskatoon has containment facilities and researchers are capable of conducting bioassays to test for clubroot for research purposes. DNA diagnostic testing is available in Alberta at the University of Alberta, 20/20 Seed Labs, and BioVision Seed Labs.

Growers and members of the agriculture and petroleum industries are encouraged to implement clubroot prevention measures and scout fields for clubroot symptoms. While it is possible that the clubroot pathogen may be present in the soil, with or without causing disease, proper crop rotation will prevent heavy infestations from developing within a field.

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Clubroot Update
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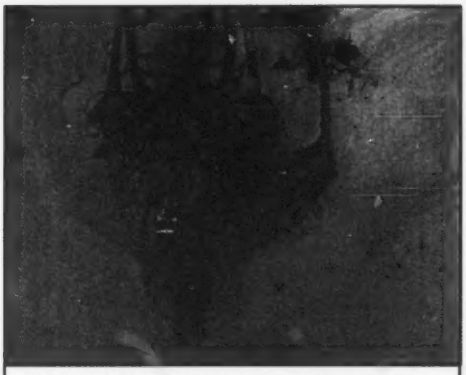

Figure 8: Under higher disease pressure, typical clubroot galls will result in stunting, wilting, and yellowing of the above-ground plant parts. Source: Saskatchewan Agriculture.

Disease scouting will help farmers gauge the health of their fields and investigate the cause of suspicious symptoms. There are other diseases and stresses that can make the plants look sick – the only way to know if it is clubroot is to check the roots for galls.

The Saskatchewan Clubroot Initiative (SCI) was established in April 2009 representing the Ministry of Agriculture, the Saskatchewan Association of Rural Municipalities, AAFC, the Saskatchewan Canola Growers Association, SaskCanola, the Canola Council of Canada, the Canadian Association of Agri-Retailers and Canadian Association of Petroleum Producers. The provincial Clubroot Management Plan was developed by SCI to promote awareness and identify priorities for clubroot prevention and management. This plan was approved and posted to the Ministry's website in June 2009. www.agriculture.gov.sk.ca/Default.aspx?DN=1c2e2764-6ad2-4b11-bfe0-207b1a60b931

Clubroot was declared a pest in Saskatchewan in 2009 in order to further strengthen clubroot prevention and surveillance in the province. Under *The Pest Control Act*, people who own, occupy or control land are now required to take steps to destroy, control and prevent the spread of clubroot. Steps may include:

- Practising a good crop rotation to reduce the viability of existing resting spores over time and to limit further increase of clubroot spores in the field. Susceptible crops should be planted no more than once every four years.
- Destroying clubroot or an infested susceptible crop; or
- Limiting movement of clubroot resting spores by cleaning equipment from infested areas. This may involve removing crop debris and soil, washing of equipment with a power washer and misting with a one-to-two-per-cent bleach solution.

For more information on clubroot identification and management:

- Visit www.clubroot.ca or www.agriculture.gov.sk.ca/Production and click Crops-Disease; or
- Contact the Agriculture Knowledge Centre at 1-866-457-2377 or the Crop Protection Lab in Regina for visual diagnosis.

For more information on clubroot as a pest:

- Visit www.publications.gov.sk.ca/details.cfm?p=804; or
- Contact Faye Dokken at 306-787-4671 or faye.dokken@gov.sk.ca ✿

Downy Mildew on Pea Crops

By Faye Dokken, Provincial Specialist, Plant Disease

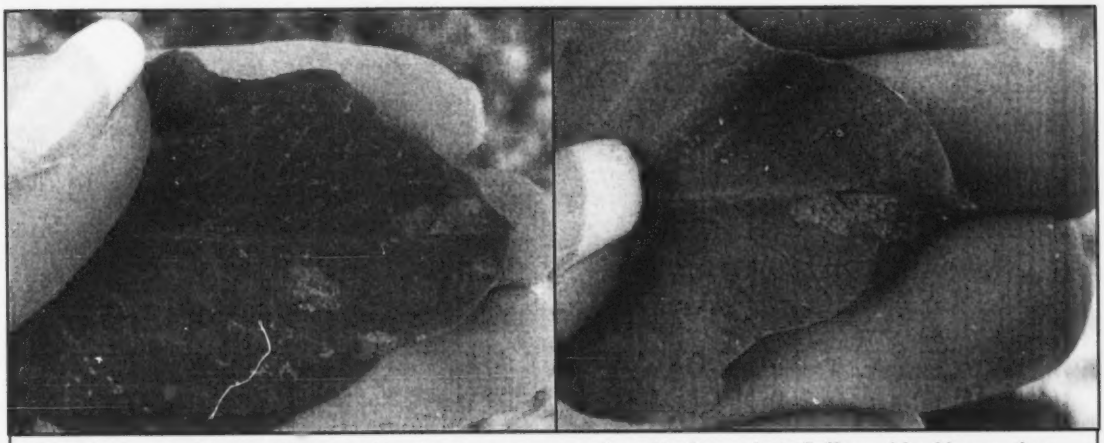

Figure 9: Downy mildew on field pea – chlorotic zones on upper surface of leaf, opposite to fluffy grayish-white growth on underside of leaf.
Source: Saskatchewan Agriculture, July 2009.

Downy mildew (*Peronospora viciae*) has been reported on pea crops again this year (Figures 9 and 10). It is showing up mostly in the northwest areas of the province following the recent heavy rains, but was also observed in central areas where conditions have also been moist. This pathogen requires these wet conditions, and has rarely been a significant problem on the Prairies. Spores can persist in the soil for more than 10 years, and pea planted on previously infected fields will be subject to this disease if wet conditions occur again. There are no registered fungicides for the control of downy mildew on pea, but research is underway to screen for possible solutions. ☼

Figure 10: Downy mildew on field pea – systemic infection may lead to stunting, foliar discolouration, and further spread of the grayish-white growth.
Source: Saskatchewan Agriculture, July 2009.

Aphids in Saskatchewan Crops

By Scott Hartley, Provincial Specialist, Insect and Vertebrate Pests

There have been reports of aphids in pea, lentil and canaryseed fields in July. Most have been in southern regions and primarily in eastern Saskatchewan. In some cases, the infestations have been close to or over economic threshold levels. Higher aphid numbers have also been reported in North Dakota and Manitoba. Although not a serious pest on most crops in most years, aphids can sometimes be problematic.

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Aphids in Saskatchewan Crops
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The following guidelines represent a compilation of research and communication with entomologists in provincial, state and federal agriculture departments from Saskatchewan, Manitoba and North Dakota.

General Considerations – All Crops:

- Being soft-bodied, aphids may be very sensitive to physical disturbance. A heavy rain or severe wind can dislodge aphids and reduce their numbers in a crop.
- There are a lot of different species of aphids in Saskatchewan. Many species will only feed on a select group of host plants. Although some may feed on more than one crop, not all species of aphids will attack all crops.
- Aphids have piercing, sucking mouthparts and prefer actively growing feeding sites. Feeding interferes with the flow of nutrients and water in the sap required for filling seeds. Once seed filling is complete and the crop ceases to be lush and actively growing, new offspring in the aphid populations will develop into winged forms and migrate to other greener crops.

Figure 11: Adult aphid.
Source: J. Gavloski, Manitoba Agriculture, Food and Rural Initiatives.

- If there is sufficient moisture, the plants may be able to compensate for some of the moisture lost to aphid feeding, but not necessarily for nutrient loss.
- Crops under moisture stress appear to be more adversely affected by aphids. If water is not a limiting factor, the crop is likely to yield well and the cost of insecticide control can more easily be recovered.
- High numbers of aphids feeding at the bases of flowers and developing pods may result in abortion of flowers, reduced filling and possibly fewer seeds per pod.

Timing and necessity of insecticide applications:

- Regular monitoring is essential in identifying changes in population densities. All crops should be treated on a case-by-case basis.
- Generally, the crucial time to monitor for aphids is at the beginning of flowering or, in cereal crops, just prior to head emergence.
- Because aphid populations tend to be aggregated or clumped in distribution, it is important to check several areas in a field to determine the extent of the infestation and economic threshold for the full field. Spot-spraying may be an option with unevenly distributed aphid populations.

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